UNIVERSITY OF CYPRUS
ECONOMICS RESEARCH CENTRE

Economic Analysis Papers

Comparisons of Productivity among European Sectors and Cyprus:

The Case of Tourism Sector

Elena Ketteni

Economics Research Centre, University of Cyprus and Frederick University

Theofanis Mamuneas

Department of Economics, University of Cyprus

No. 09-15

December 2015

ERC Sponsors (in alphabetical order)

Central Bank of Cyprus

Economics Department, University of Cyprus

Ministry of Finance

Ministry of Labour, Welfare and Social Insurance

Planning Bureau

University of Cyprus

Comparisons of Productivity among European Sectors and Cyprus: The Case of Tourism Sector

Elena Ketteni[*] and Theofanis Mamuneas

Executive Summary

The importance of the tourism industry for economic, social and cultural development in Europe and the role of tourism as a driver of development are well known. In Cyprus tourism industry is one of the five biggest industries with a 7% share in the GDP of the economy. The tourism sector was and will be very important in the future as far as the economic growth of the Cypriot economy is concerned. For the tourism sector to continue to grow it needs to improve its competitiveness, especially since lately we are facing large competition not only from the south Mediterranean countries but from new star performers in Central and Eastern Europe. One way to improve competitiveness is via increasing its productivity.

In this paper we examine how factors such as the quality of service, quality of the environment, public infrastructure, culture and safety can explain the observed output and productivity differences among Cyprus and 21 European countries. In addition to these factors, the output difference of tourism industry is decomposed to capital and labor input differences and productivity differences. For our analysis we have collected recent data from Eurostat, covering a period before and after the economic crisis (2000-2012) on the tourism sectors of 21 European countries. Our sample consists of the following countries: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Italy, Lithuania, Luxembourg, Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain and UK.

We find that the countries with the highest output difference are: Spain, Italy, UK, France and Germany, followed by, Greece, Austria, Netherlands, Portugal and Belgium. The rest of the countries are below the hypothetical

---

[*] Corresponding author: E-mail: bus.ke@frederick.ac.cy

country with respect to output of the tourism industry. Those with the lowest output are Estonia, Denmark, Lithuania and Czech Republic. We observe that in most of the countries the major contributor to output differences is traditional inputs. This result indicates that countries with a large labor force (size) and high investment will have larger positive output differences, while countries with a smaller labor force and less investment will tend to be below the average with respect to output. After controlling for the size of the labor force and investment in a country we observe that quality of services and the government expenditures on safety, culture and infrastructure have a positive contribution to the output difference of the sector. As expected, quality of the environment captured by waste generated has a negative contribution to output. Finally, with respect to productivity differences we see that its contribution varies and it's a significant one.

Cyprus is below the hypothetical country with respect to output, and close with respect to observed productivity. As in the other countries, the major role comes from traditional inputs. It seems though that government expenditures on safety, culture and infrastructure and quality of services are not sufficient to enhance Cyprus to a better position.

Contents

ΠΕΡΙΛΗΨΗ

Η σημασία της τουριστικής βιομηχανίας για την οικονομική, κοινωνική και πολιτιστική ανάπτυξη της Ευρώπης και ο ρόλος του τουρισμού ως κινητήριας δύναμης της ανάπτυξης είναι γνωστός. Ο τομέας του κυπριακού τουρισμού ήταν και θα είναι πολύ σημαντικός για το μέλλον όσον αφορά την οικονομική ανάπτυξη της χώρας. Για να συνεχίσει να αναπτύσσεται όμως πρέπει να βελτιώσει την ανταγωνιστικότητά του, δεδομένου μάλιστα ότι τα τελευταία χρόνια βρισκόμαστε αντιμέτωποι με μεγάλο ανταγωνισμό, όχι μόνο από τις νότιες χώρες της Μεσογείου αλλά και από νέους ανταγωνιστές στην Κεντρική και Ανατολική Ευρώπη. Ένας τρόπος για τη βελτίωση της ανταγωνιστικότητας είναι μέσω της αύξησης της παραγωγικότητας. Ο κύριος στόχος αυτής της μελέτης ήταν να συγκρίνει τις διαφορές στο προϊόν και τη παραγωγικότητα της τουριστικής βιομηχανίας μεταξύ Κύπρου και Ευρωπαϊκών χωρών, για την περίοδο 2000-2012. Εξετάστηκε το πως παράγοντες όπως η ποιότητα των υπηρεσιών, η ποιότητα του περιβάλλοντος, η δημόσια υποδομή, ο πολιτισμός και η ασφάλεια μπορούν να εξηγήσουν τις παρατηρούμενες διαφορές στο προϊόν και τη παραγωγικότητα μεταξύ της Κύπρου και 20 χωρών της Ευρώπης. Εκτός από αυτούς τους παράγοντες, η διαφορά στο προϊόν της τουριστικής βιομηχανίας οφείλεται σε διαφορές στο κεφαλαίο και την εργασία και σε διαφορές στην παραγωγικότητα.

Οι χώρες με υψηλότερο προϊόν είναι: η Ισπανία, η Ιταλία, το Ηνωμένο Βασίλειο, η Γαλλία, η Γερμανία, η Ελλάδα, η Αυστρία, η Ολλανδία, η Πορτογαλία και το Βέλγιο. Στις περισσότερες χώρες η διαφορά στο προϊόν οφείλεται στις διαφορές των παραδοσιακών εισροών (εργατικού δυναμικού και επενδύσεων). Η ποιότητα των υπηρεσιών και οι δημόσιες δαπάνες για την ασφάλεια, τον πολιτισμό και τις υποδομές έχουν θετική συμβολή στη διαφορά του προϊόντος. Η ποιότητα του περιβάλλοντος, που μετριέται από τα απόβλητα που δημιουργούνται έχει αρνητική συμβολή στο προϊόν. Τέλος, διαφορές στην παραγωγικότητα έχουν σημαντική συμβολή στο προϊόν. Η Κύπρος είναι κάτω από τον μέσο όρο σε σχέση με το προϊόν του τουριστικού τομέα, και κοντά σε σχέση με την παραγωγικότητα. Όπως και στις άλλες χώρες, σημαντικό ρόλο παίζουν οι παραδοσιακές εισροές που είναι σε χαμηλότερα επίπεδα από το μέσο όρο. Οι δημόσιες δαπάνες και η ποιότητα των υπηρεσιών δεν είναι επαρκείς, και η ποιότητα του περιβάλλοντος συμβάλλει στη μείωση της διαφοράς του προϊόντος του τομέα.

1. INTRODUCTION

The importance of the tourist industry for economic, social and cultural development in Europe and the role of tourism as a driver of development are well known. EU countries are the leading tourism destination (42% of the total tourism arrivals in the world), and this position is expected to remain so in the next decade. As tourism demand grows steadily, the industry has increasingly generated additional employment, turnover and added value.

In Cyprus, tourism sector is one of the five biggest sectors with a 7% share in the GDP of the economy. In 2014, the sector experience an output growth of 3.6% while the total economy and other sectors experience negative growth rates (-2.5% for the economy).The Central Bank of Cyprus reports that in the first four months of 2014 there was a 1.4% increase in tourist arrivals and a 4.7% increase in revenues from tourism during the first two months of 2014. The share of the sector in total employment was 8.9% in 2008 reaching 10.2% in 2014. The tourist industry was and will be very important in the future as far as the growth of the Cypriot economy is concerned.

Competition is extensive with respect to tourism between Cyprus and other European countries, especially south Mediterranean countries including Spain, Italy, Greece, Malta and Portugal. New star performers in Central and Eastern Europe such as Slovakia, Bulgaria, Latvia and Lithuania pose a threat to the share of tourism for the Cypriot economy. The Cypriot tourism sector needs to be more competitive in order to grow, and one way to improve competitiveness is via increasing productivity.

The major objective of this study is to compare the output and productivity differences of tourism among Cyprus and European countries. Productivity and output differences might arise for many reasons and therefore the former needs constant improvements and depends on the country's ability to keep the sector competitive. Productivity is affected by the quality of the labor force and the efforts to adopt new information and communication technologies (Anastasopoulos and Patsourakis, 2004). According to The European Commission the challenges for the tourist industry is to reinforce it as a high quality service sector using a combination of strong resources with high quality services.

Improving tourism productivity depends not only on the providers of tourism services but also on Governmental policies with respect to improving infrastructure in a country, such as roads, transportations, airports and telecommunications (Mamuneas et. al, 2005; Mamuneas and Pashardes, 2003; Pashardes et. al, 2002). Another important factor that improves productivity is the cultural and national environment of a country (Sinclair, 1998; Mamuneas et. al, 2005; Mamuneas and Pashardes, 2003; Pashardes et. al, 2002). Safety and security seems to be important for tourist demand and therefore the growth of the industry (Clerides et. al, 2006; Cleanthous, 2008).

European Commissions suggests that the tourist industry along with the public sector could make more focused efforts to attract additional non-EU visitors by differentiating itself from the other world destinations. Further, the tourist industry and governments should take actions to support tourism demand, to stimulate innovation and entrepreneurship, to combine available resources more efficiently, to ensure that development of tourism is sustainable. In addition public sector should ease the complex regulation framework and tax system in which the EU tourism enterprises operate. Lionetti (2009) specifically states that the role of the Government should not be to subsidize the hotel industry directly but to support and invest on the environment and legal framework in which the tourism firms compete.

In this paper we examine how factors such as the quality of service, quality of the environment, public infrastructure, culture and safety can explain the observed output and productivity differences among Cyprus and 21 European countries. In addition to these factors, the output difference of tourism industry is decomposed to capital and labor input differences and productivity differences. For our analysis we have collected recent data from Eurostat, covering a period before and after the economic crisis (2000-2012) on the tourism sectors of 21 European countries. Our sample consists of the following countries: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Italy, Lithuania, Luxembourg, Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain and UK.

We find that the countries with the highest output difference are: Spain, Italy, UK, France and Germany, followed by, Greece, Austria, Netherlands, Portugal and Belgium. The rest of the countries are below the hypothetical country with

respect to output of the tourism industry. Those with the lowest output are Estonia, Denmark, Lithuania and Czech Republic. We observe that in most of the countries the major contributor to output differences is traditional inputs. This result indicates that countries with a large labor force (size) and high investment will have larger positive output differences, while countries with a smaller labor force and less investment will tend to be below the average with respect to output.

After controlling for the size of the labor force and investment in a country we observe that quality of services and the government expenditures on safety, culture and infrastructure have a positive contribution to the output difference of the sector. As expected, quality of the environment captured by waste generated has a negative contribution to output. Finally, with respect to productivity differences we see that its contribution varies and it's a significant one.

Cyprus is below the hypothetical country with respect to output, and close with respect to observed productivity. As in the other countries, the major role comes from traditional inputs. It seems though that government expenditures on safety, culture and infrastructure and quality of services are not sufficient to enhance Cyprus to a better position.

2. EMPIRICAL IMPLEMENTATION AND DATA

2.1 Methodology

In order to analyze the output and productivity differences among European countries we define the production function of a country as:

$$Y = F(K, L, Z, s), \tag{1}$$

where *Y* is the quantity of output, *K* is the capital input; *L* is the labor input; *s* is an indicator of productivity and Z are a set of other explanatory variables that may affect the output of the tourism sector.

Caves, Christensen and Diewert (1982), develop a methodology for making consistent multilateral comparisons by considering a hypothetical representative country h. Therefore, one can show that the output difference of a country s with h can be written as:

$$y = \delta + x + z, \tag{2}$$

where $y = \left(lnY_{st} - lnY_{ht_h}\right)$ is the output difference with the hypothetical country, $x = \frac{1}{2}(W_{Kst} + W_{Kht})(lnK_{st} - lnK_{ht}) + \frac{1}{2}(W_{Lst} + W_{Lht})(lnL_{st} - lnL_{ht})$ is traditional input (capital and labor) differences with the hypothetical country weighted using output shares,

$z = \sum_i b_i(lnZ_{ist} - lnZ_{iht})$ is other factors that might contribute to output differences and $\delta = ln\delta_{st} - ln\delta_{ht}$ is the productivity differences.

The components δ and b_i for z are not directly observable. In order to obtain these components, we proceed, as a first step, and construct the observed productivity difference with the hypothetical country using only capital and labor which:

$$\lambda = y - x = \delta + z, \tag{3}$$

We then have:

$$\lambda_{st} = \delta_{st} + \sum_i b_i \left(lnZ_{ist} - \overline{lnZ_{it}}\right), \tag{4}$$

where the left hand side, λ, is the observed productivity difference, and from the right hand side the first component $\delta = ln\delta_{st} - ln\delta_{ht}$ is productivity difference and the second is the contribution of other factors to be estimated.

2.2 Data

In order to utilize the multilateral comparison methodology, we focus our analysis on the years 2000-2012 and on the countries of: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Italy, Lithuania, Luxembourg, Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain and UK.

We obtained data from several publications of Eurostat and the European Commission.

The variables used are the Gross Domestic Product, the total Hours Worked, Investment, and the Compensation of Employees. The quantity of output is defined as the GDP in constant prices. The quantity of labor is defined as the value of labor divided by the price of labor. The compensation of employees is adjusted to include the self-employed. The capital stock was constructed from investment data in constant prices by using the perpetual inventory method with a 5% depreciation rate. The value of capital was obtained by subtracting from the GDP in current prices . Following Christensen, Cummings and Jorgenson (1981) and Jorgenson and Nishimizu (1978) in order to be able to compare countries, we require comparable measures of factor inputs and output. To achieve comparability in measuring output and factor inputs one needs to employ purchasing power parities (PPP) of output, capital and labor for all the countries under consideration. Therefore, all price and quantity data are expressed in constant 2000 Euros and are PPP adjusted.

The control explanatory variables used to examine their effect on productivity were obtained from Eurostat. The variables used are: quality of services warranted by nights spent at tourism accommodations, and quality of environment captured by waste generated in each country. Also following the literature we have obtained data on government expenditures on order and safety, economic infrastructure (transport and communications), and recreation, culture, religion.

3. PRODUCTIVITY DIFFERENCE

Using equation:

$$\lambda = y - x = \left(lnY_{st} - lnY_{ht}\right) - [\frac{1}{2}(W_{Kst} + W_{Kht})(lnK_{st} - lnK_{ht})$$
$$+ \frac{1}{2}(W_{Lst} + W_{Lht})(lnL_{st} - lnL_{ht})]$$

[we have obtained the following observed productivity differences of countries when compared to the hypothetical one (positive numbers means that a country is above the hypothetical with respect to productivity while negative the

opposite).] Following Caves, Christensen and Diewert, the hypothetical country's variables are defined as the geometric means of output, input and share vectors of the countries in our sample.

Table 1: Observed Productivity Differences, λ

Luxembourg	0.476
France	0.466
Finland	0.462
UK	0.398
Slovenia	0.313
Belgium	0.264
Netherlands	0.220
Spain	0.199
Portugal	0.170
Italy	0.160
Germany	0.115
Austria	0.065
Slovakia	0.049
Cyprus	0.033
Greece	-0.040
Estonia	-0.206
Bulgaria	-0.206
Lithuania	-0.592
Poland	-0.720
Denmark	-0.866
Czech	-1.492

Figure 1: Observed Productivity Differences
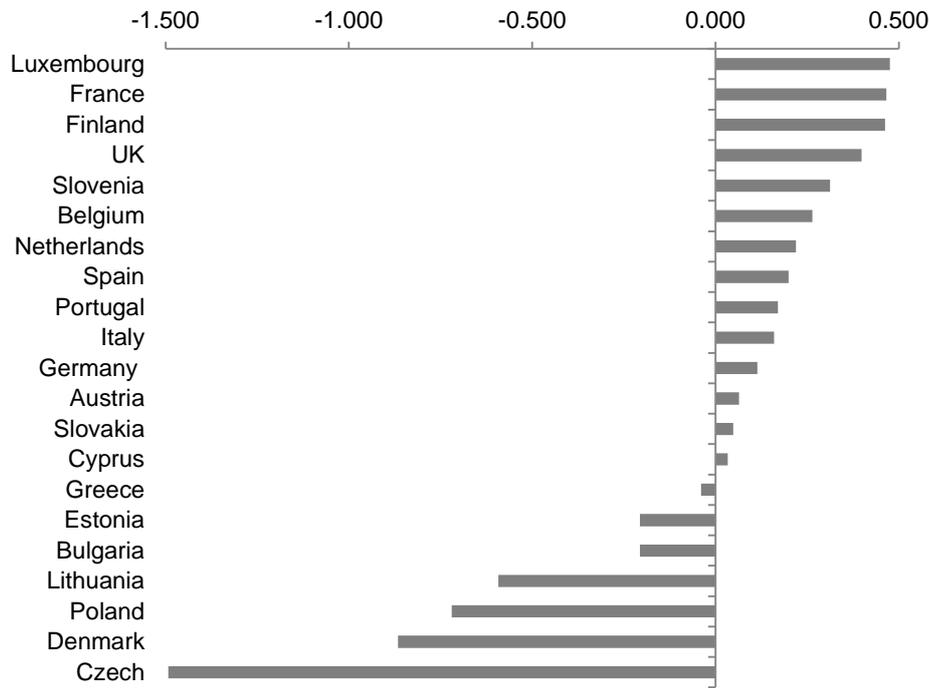
From Table 1 (and Figure 1) we observe 3 groups of countries. The first group with the highest observed productivity differences includes: Luxembourg, France, Finland, UK, Slovenia, Belgium, Netherland, Spain, Portugal and Italy. The country with the highest observed productivity is Luxembourg, followed by France and Finland. The second group includes countries near the average (hypothetical). These are: Germany, Austria, Slovakia, Cyprus and Greece. Finally Estonia, Bulgaria, Lithuania, Poland, Denmark and Czech are the countries in the third group which appear to have the lowest observed productivity. Czech Republic is the country that is last in the ranking with respect to observed productivity of the tourism sector.

In a recent report (Eurostat, 2015 [1]) it is observed that the tourism accommodation sector continues to grow in terms of overnight stays. Only in

---

[1] Eurostat, Statistics Explained. Tourism statistics – annual results for the accommodation sector, March 2015.

three countries - Cyprus, Italy and Finland did the rate decrease in 2013. In six member states (Bulgaria, Greece, Latvia, Lithuania, Malta and Portugal) the rate recorded growth over 6%. According to the latest figures, international tourist arrivals in Europe grew by 5% during the first half of 2013. Among the Mediterranean countries, Spain led the way in 2013. Tourism in Greece has grown along with Malta and Portugal. Less satisfactory figures come from Cyprus where arrivals of tourists decreased in 2013. Star performers in Central and Eastern Europe were Slovakia, Latvia and Lithuania. In Northern Europe results were also good but more modest, except for the UK. France benefited from an increase in international visitors, which compensated for a decrease in the number of local tourists.

Cyprus needs to improve its competitiveness, otherwise the share of tourism arrivals and nights stays will decrease because of other more competitive tourism destinations. The major drivers of higher productivity and therefore competitiveness come from human capital (education, skills, training on and off the job and quality of management), technology and innovation (Blake and Sinclair; 2006). Specifically, skills are needed if best practice techniques are to be implemented and innovations that result in product quality and service than from cost-cutting are required for growing markets such as business and cultural tourism. As Lionetti (2009) also stated: although there are many factors that influence the levels and changes in tourism supply, the level of literacy, the level of communication technologies and openness to foreign markets are very important in explaining different levels of productivity across countries. The more these variables are taken into consideration in a country, the more productive the tourism industry is in that country, the more these countries are able to compete in the world market.

4. OUTPUT DIFFERENCES

In this section we obtain the output differences of the countries in our sample along with the contribution of each factor difference (as shown in equation 1). As mentioned though, the components z and δ are not directly observed and need

to be estimated. The OLS dummy variable regression of equation (4), will give us estimates of the effects (b_i) of the explanatory variables differences (and therefore we will be able to obtain z) and also allows us to estimate the productivity differences (δ) among the countries of our sample, captured by a set of dummy variables.

Table 2: Regression results

Variable	Estimated Coefficient	Standard Error
Quality of Services	0.114	0.069
Quality of Environment	-0.163	0.096
Safety and Culture	0.157	0.100
Infrastructure	0.035	0.053

R-squared = .964650

Adjusted R-squared = .960739
F (zero slopes) = 246.685 [.000]
Dummy variables are included in the analysis to capture exogenous productivity differences

The estimation results are reported in Table 2. The nights spend at tourism establishments used as alternative measure of quality of services, and government expenditure on safety, culture and infrastructure have a positive effect on the observed productivity of the tourism sector. Quality of the environment proxied by the waste generation has a negative effect on the observed productivity. As indicated by R-square and F-test the model fits well and variables included are jointly significant and cannot be rejected.

Using these results along with the traditional variables (capital and labor) we can obtain a decomposition of output in each country (equation 2) to:

The productivity difference component, δ, which can be also viewed as the unobserved productivity of the sector after controlling for all available exogenous factors.

The contributions z from the available factors. These contributions have two components.

The contributions of traditional inputs capital and labor, x

Table 3: Output Decomposition (Contributions to Output Differences)

Country	Output	Traditional Inputs	Quality of Services	Quality of Environment	Safety and Culture	Infrastructure	Productivity
	y	x			z		δ
Spain	3.093	2.894	0.265	-0.279	0.282	0.065	-0.133
Italy	2.773	2.613	0.261	-0.314	0.351	0.072	-0.210
UK	2.644	2.246	0.217	-0.327	0.423	0.070	0.015
France	2.408	1.942	0.235	-0.326	0.355	0.075	0.127
Germany	2.369	2.254	0.244	-0.387	0.394	0.086	-0.222
Greece	1.262	1.302	0.099	-0.018	0.001	0.003	-0.125
Austria	1.218	1.154	0.130	-0.011	0.036	0.022	-0.113
Netherlands	0.984	0.764	0.026	-0.123	0.193	0.047	0.076
Portugal	0.931	0.761	0.044	-0.015	-0.002	-0.002	0.145
Belgium	0.472	0.208	-0.053	-0.017	0.094	0.029	0.211
Finland	-0.323	-0.786	-0.059	0.093	-0.045	0.002	0.472
Poland	-0.826	-0.106	-0.019	-0.151	0.072	0.017	-0.638
Slovakia	-0.988	-1.037	-0.145	0.175	-0.171	-0.046	0.236
Cyprus	-1.065	-1.098	-0.060	0.349	-0.359	-0.089	0.192
Slovenia	-1.281	-1.594	-0.174	0.255	-0.267	-0.060	0.559
Bulgaria	-1.300	-1.093	-0.063	0.008	-0.228	-0.063	0.140
Luxembourg	-1.751	-2.226	-0.334	0.430	-0.353	-0.059	0.792
Estonia	-2.380	-2.174	-0.228	0.358	-0.378	-0.094	0.136
Denmark	-2.477	-1.611	-0.100	0.034	-0.048	-0.004	-0.748
Lithuania	-2.848	-2.256	-0.292	0.202	-0.309	-0.073	-0.120
Czech	-2.916	-1.424	0.005	0.064	-0.042	0.004	-1.523

Table 3 reports the decomposition of output differences and the contribution of traditional inputs, quality of service, environment, safety and culture, infrastructure and productivity.

The countries with the highest output difference from the hypothetical country (average) are: Spain, Italy, UK, France and Germany. Followed by, Greece, Austria, Netherlands, Portugal and Belgium. The rest of the countries appear to be below the hypothetical country with respect to output of the tourism industry. The last four are Estonia, Denmark, Lithuania and Czech Republic.

From Table 3 we observe that in most of the countries the major contributors to output differences are traditional inputs (in most cases above 75%). In countries

where traditional inputs are higher than the average this results in a higher output difference, while in the opposite scenario where countries have less inputs than the hypothetical, this results in negative output differences. In both cases traditional inputs play a major role (either positive or negative) in the output difference of a country. Only three exceptions exist in our sample; Belgium with 44% contribution of inputs, Poland with 13% and Czech with 48%. Several studies suggest that the major drivers of growth in the tourism sector are labor followed by physical capital (equipment, machinery and building). Low investment result in a considerable amount of old capital stock affecting the efficiency of the sector. Also small businesses often face problems in raising funds for investment which limits their growth (Blake and Sinclair, 2006; Lionetti, 2009).

After controlling for the size of the labor force and investment in a country we observe the other factors that may affect the output difference such as productivity and other components such as quality of services, environment and government expenditures. With respect to the other components, we observe that quality of services and the government expenditures on safety and culture have a positive contribution to the output difference of the sector, especially in countries which have overnight stays and expenditure higher than the average. We observe a negative contribution from countries with overnight stays and expenditures below the average. But in combination with the regression results and the positive effects from these variables, we can conclude that, increases in the number of nights spent and in the government expenditure on safety and culture causes an increase in the output of the tourism sector.

A similar picture is observed with respect to government expenditure in infrastructure but the contribution of this variable to output is smaller compared to the other variables. As expected, waste generated in a country used to proxy environment pollution has a negative contribution to output, especially in countries with pollution higher than the average. In countries with pollution lower than the average (better with respect to pollution), the contribution is positive. Finally, with respect to productivity differences we see that its contribution varies and it's a significant one.

The results are in accordance to an OECD paper stressing the indicators defining competitive in tourism (Dupeyras and MacCallum, 2013). In their article

they state that based on detailed survey evidence, OECD countries largely agree on the following key elements to be considered in a tourism competitive assessment. These are: Governance of tourism (Government support through regulations, a whole tourism strategy, safety and security and budget allocated to tourism support); product development which includes product differentiation, innovation, investments and increase in the added value of tourism; improving quality of tourism services; price competitiveness; infrastructure development and geo-strategic position of the destination (accessibility and connectivity); branding of the destination through good promotion and marketing; natural and cultural resources such as good climate and biodiversity; and human resource development (skills, education and training).

The output of the Cyprus tourism sector performs below the hypothetical country. The main reason for this is found in traditional inputs (capital and labor) which are also below the average. The observed productivity difference is above and close to the average, thus contributing to closing the gap in output difference. With respect to nights spend and government expenditures on safety, culture and infrastructure Cyprus is below the hypothetical. So the government expenditures and nights spend are not sufficient to put Cyprus in a better position with respect to output. With respect to environmental pollution Cyprus appears to be doing better. It is again below the hypothetical country, but in this case it suggests lower pollution. Finally, with respect to productivity (unobserved) Cyprus is above the average, which contributes to decreasing the output difference with the hypothetical country. The Cypriot tourism sector is lacking in output and somehow in productivity, when compared to other countries. It needs to constantly improve its productivity and therefore output in order to remain competitive. Cyprus, has the available natural and cultural resources, but may be lacking in the other key elements needed to improve productivity and competitiveness of the tourism sector.

5. CONCLUSION

The purpose of this study is to compare the output and productivity of the tourism sector among European countries and Cyprus. For this analysis we have collected recent data from Eurostat, covering a period before and after the economic crisis (2000-2012) on the tourism sectors of 21 European countries.

Our sample includes: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Italy, Lithuania, Luxembourg, Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain and UK.

The output ranking of the countries beginning with the highest to the lowest is: Spain, Italy, UK, France, Germany, Greece, Austria, Netherlands, Portugal, Belgium, Finland, Poland, Slovakia, Cyprus, Slovenia, Bulgaria, Luxembourg, Estonia, Denmark, Lithuania and Czech Republic. The major contributor to the output of a country is capital and labor inputs. Large labor force and high investment contribute to a higher output. Positive contributions to output come also from better quality of services and higher government expenditures on safety, culture and infrastructure. As expected, quality of the environment captured by waste generated has a negative contribution to output. Finally, with respect to productivity differences we see that its contribution varies and it's a significant one.

In Cyprus the output of the tourism sector appears below the average on the ranking list. The main reasons for this outcome are smaller labor force and lower investment than the average. The lower than the average quality of services as well as the low government expenditures on safety, culture and infrastructure also contribute to the position of the Cypriot economy in the ranking. Cyprus appears to be doing better, with respect to the environment since the results indicate a smaller pollution than the average. Finally, with respect to productivity (unobserved) Cyprus is above the average, which contributes in decreasing the output difference with the hypothetical country. However, measures are needed so that the Cypriot tourism sector can compete in the future. Otherwise Cyprus will lose a very important contributor to its economic growth.

REFERENCES

Anastasopoulos, G. and Patsouratis, V. (2004), Labour productivity and competitiveness: an initial examination of the hotels and restaurants sector in selected countries, Journal of Economics and Business, vol. 7 (2), p. 63-79

Blake, A and Sinclair, M.T. (2006), Tourism Productivity: Evidence from the United Kingdom, Annals of Tourism research, vol. 33 (4), p.1099-1120

Caves, D.W., Christensen, L.R. and Diewert, W.E. (1982), Multilateral Comparisons of Output, Input and Productivity using Superlative Index Numbers, The Economic Journal, vol. 92 (365), p. 73-86.

Christensen, L.R., Cummings, D. and Jorgenson, D.W. (1981), Relative Productivity levels 1947-1973: An International Comparison, European Economic Review, 16, p.61-94

Cleanthous, P. (2008), Determinants of tourism demand in Cyprus, Economic Policy Paper, No. 07-08, University of Cyprus.

Clerides, S. et al (2006), Tourists' evaluation of Cyprus, Economic Policy Paper, No. 08-06, University of Cyprus.

Dupeyras, A. and MacCallum, N. (2013), Indicators for measuring competitiveness in tourism, OECD Tourism Papers, 2013/02, OECD Publishing

Lionetti, S. (2009), Tourism Productivity: incentives and obstacles to fostering growth, Decanato della Facoltà di Scienze economiche, Quaderno N. 10-09

Mamuneas, T. and Pashardes, P. (2003), Ανάλυση της παραγωγικότητας του κυπριακού τουριστικού προϊόντος, Δοκίμια Οικονομικής Πολιτικής, No. 08-03, Πανεπιστήμιο Κύπρου.

Mamuneas, T. et al (2005), Τομεακή Ανάλυση της παραγωγικότητας της Κυπριακής οικονομίας, Δοκίμια Οικονομικής Πολιτικής, No. 04-05, Πανεπιστήμιο Κύπρου.

Pashardes, P. et al (2002), Παραγωγικότητα, Τιμή και Ποιότητα του Κυπριακού Τουριστικού Προϊόντος, Μονάδα Οικονομικών Ερευνών, Πανεπιστήμιο Κύπρου.

Sinclair, M. T. (1998), Tourism and economic development: a survey, The Journal of Development Studies, 34 (5), p. 1-51

RECENT ECONOMIC POLICY/ANALYSIS PAPERS

08-15   Clerides, S. and C. Karagiannakis " Recent trends in the Cypriot electronic communications sector" December 2015.

07-15   Koutsampelas, C., S. Andreou and P. Tsakloglou "The Progressivity of Public Education in Greece in the Era of Depression", December 2015.

06-15   Kourtellos, A, and K. Petrou "Preferences for Redistribution in Cyprus", December 2015.

05-15   Charalambous, A. "The Cyprus Adjustment Programme – Necessity or Wrong Medicine", November 2015.

04-15   Zachariadis, T. "How Can Cyprus Meet Its Energy and Climate Policy Commitments? The Importance of a Carbon Tax", November 2015.

03-15   Karagiannakis, C., Pashardes, P., Pashourtidou, N. and S. Andreou, "The CypERC Property Price Index: Data and Estimation methods", November 2015.

02-15   Savva, C.S., "House Price Dynamics and the Reaction to Macroeconomic Changes: The Case of Cyprus", October 2015.

01-15   Pashourtidou, N. and C.S. Savva, "Persistence and Sources of Shocks in the Cypriot Economy: A Multi-sectoral Model", August 2015.

11-14   Papamichael, C. and N. Pashourtidou, "Forecasting Cyprus GDP and its demand components: Applications of dynamic factor models", December 2014.